

2.6 Challenges and Data Gaps

Tremendous amounts of data are being collected on water resources. These data provide evidence of water quality condition at the national, regional, and state scales. Some of these data are sufficiently comprehensive in scope to serve as the basis for indicators of water quality at the national level. These indicators provide a starting point for describing our nation's water quality. However, as discussed below, they also have limitations that make it difficult to make confident statements about the condition of water resources at the national scale or to thoroughly describe the stressors that degrade that condition.

2.6.1 Waters and Watersheds

Several indicators are available that provide information about the quality of our nation's waters and watersheds. For wetlands, for example, the relevant indicator shows that the rate of wetland loss has dropped dramatically in recent years. However, as discussed in Section 2.2.2, there currently are no indicators of wetland biological condition and none are being implemented at the national or regional scale. Without these indicators and an assessment process, ensuring that the net gain goal is sustaining not only wetland extent, but also wetland condition, will not be possible.

Drawing accurate conclusions about the condition of surface waters can be equally as challenging as for wetlands, but the indicators in this area do provide evidence of some success in reducing important stressors. In addition, data suggest that atmospheric deposition of sulfates has been reduced (EPA, ORD, January 2003), which will help improve the quality of acidic surface waters. Ongoing efforts by EPA (for example, through the National Pollutant Discharge Elimination System permit program), the U.S. Department of Agriculture, and individual states to reduce the amount of pollutants discharged to our nation's waters from both point and non-point sources will also help to improve water quality.

However, many challenges remain in monitoring water quality and taking steps to improve water quality. This is, in part, because significant environmental problems persist, despite environmental management activities to address these problems. Persistent hypoxia in the Gulf of Mexico and fish contaminated by toxic organics and mercury are examples.

To better address water quality problems in the future, more and better quality data on the condition of waters and watersheds will be needed. This will require a greater collaboration among the federal agencies that participate in monitoring and managing our nation's waters so that results and metadata can be provided in a

common format. Data in a common format will be much more useful for developing or improving indicators and can also more easily be made available to the public. In addition, the relevant federal agencies should work with the states to design and implement cost-efficient water quality monitoring programs whose data will be useful not only to the state water quality programs, but also to national water quality characterizations. State resources often are limited for such key activities as characterizing waters, identifying sources of watershed stress, and monitoring the effects of implementing pollution controls. Therefore, it is critical to encourage the development, dissemination, and use of cost-effective monitoring and assessment tools, such as biological methods for water quality assessment and a new framework for design and data collection in water quality monitoring programs.

2.6.2 Drinking Water

The indicator for the quality of treated drinking water in the U.S. shows that quality of drinking water has improved from the early 1990s through 2002. This indicator is based on health standards violations by community water systems that are reported by states to EPA's Safe Drinking Water Information System (SDWIS). The systems that are monitored under SDWIS serve water to about 95 percent of the U.S. population. Compliance trends may change in the future as new regulations create new compliance challenges for public water systems.

The primary limitation of this indicator is under-reporting and late reporting of community water systems violations by states to EPA. This affects the accuracy of annual reports produced using SDWIS and thus the quality of the indicator. EPA last quantified data quality in 1999 and estimated that states were not reporting 40 percent of all health-based violations. EPA and states are taking steps to address identified deficiencies and to improve data quality. A survey of reporting completeness is underway. Another limitation of the indicator is that it does not cover the quality of water from private wells.

It is important to understand the condition of the raw waters (both ground water and surface waters) that serve as drinking water sources. For example:

- States are currently conducting assessments to delineate the extent of source waters and identify potential contaminant sources.
- Data provided by the U.S. Geological Survey under its National Water Quality Assessment program and occurrence data for unregulated contaminants collected by EPA under the Safe Drinking Water Act (SDWA) also provide information about raw water stressors, and are used by EPA to determine whether additional contaminants should be regulated under the SDWA.
- It is important that EPA assure that the frequency of sampling is adequate to characterize episodic events affecting source water quality.

The incidence of waterborne disease is another parameter that could be used to describe and track water quality at the national level. Additional efforts to obtain data could help provide a basis in the future for a national-level indicator in this area. This would, however, require significant new work, as the existing data likely reflect an unknown but probably very large degree of under-reporting. For example, there currently are no consistent national surveillance and reporting requirements for doctors or states with respect to incidence of diarrhea, except as associated with Hepatitis A, cholera, salmonellosis, or shigellosis. Doctors rarely order the tests that would identify these diseases, or tests that would identify other, more common diseases that can be caused by contaminants in drinking water.

2.6.3 Recreation in and on the Water

The quality of recreational waters is compromised when pollution increases the level of pathogens or (to a lesser extent) chemical contaminants in those waters past thresholds judged safe for human exposure. When this happens at a monitored beach, particularly for pathogens, local or state authorities close or issues advisories for beaches. Sufficient information is available to provide the basis for an indicator about the risks to public health from exposure to pathogens in recreational water at coastal and Great Lakes beaches. Although the indicator shows that the number of beaches with advisories or closures has increased in recent years, this trend simply represents the fact that more beaches are providing information. In fact, as the indicator shows, the percent of beaches under advisory or closure has been fairly constant over the last few years. Overall, relatively few days (six percent of the days beaches could be open) have been lost due to pathogen exposure. This indicator is limited by three considerations:

- The number of beach days closed or under advisory does not directly measure pathogens or contaminants in water.
- Reporting of beach days closed or under advisory is voluntary, thus the ability of this indicator to describe conditions nationwide is unknown.
- At this time, this indicator applies primarily to coastal and Great Lakes beaches, as most fresh water inland beaches are not surveyed.

- Improving the value of this indicator as a national measure of recreational water quality would entail an assessment of the presence of pathogens in all waters used for recreational activities. Chemical contaminants would need to be selectively measured in waters with known risk from contamination.

2.6.4 Consumption of Fish and Shellfish

Three indicators are available to help describe the condition of surface waters that support fish and shellfish consumption. For example, information about specific areas where contaminants in fish are above public health thresholds is available. One indicator suggests that the number of lake acres and river miles for which fish consumption advisories have been issued is increasing. This trend may represent an increase in monitoring, more stringent state health standards, or increased contamination. Other indicators show that the vast majority of sampled fish are contaminated to some degree and that contamination for particular pollutants (mercury and PCBs) tends to be concentrated in certain areas of the country. For all three indicators, it is important to note that sampling tends to focus on areas where states know fishing occurs or suspect there may be a contamination problem, so the data may over-report or under-report the degree and extent of contamination. Also, monitoring of fish and shellfish at the state level is very inconsistent, and different criteria are used to issue advisories.

A true national assessment of the safety of fish and shellfish for human consumption can only be accomplished through a comprehensive, representative survey of pathogens and chemical contaminants in edible fish tissue in all waters. A national survey of this type, involving 500 lakes and reservoirs, is underway. Initial data on 268 contaminants in the tissue of fresh water fish have been collected. These data are not presented in this report because they reflect only one year of a four-year study and, as such, are not ready for public release. However, they should be available for future use as a potential indicator.